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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,018	06/25/2001	Hans O. Ribí	SEGA.004.01US	2628

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EXAMINER

HAWES, PILI ASABI

ART UNIT	PAPER NUMBER
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1615

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/892,018	Applicant(s) RIBI, HANS O.	
	Examiner Pili A. Hawes	Art Unit 1615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25, 29-33, 38-42 and 85 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25, 29-33, 38-42 and 85 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

Receipt of the Remarks and Amendments filed 04-06-2006 is acknowledged. Claims 26-28, 34-37, 43-83 are withdrawn and 84 canceled. Claims 1-25, 29-33, 38-42 and 85 are pending in this action. Claims 1-25, 29-33, 38-42 and 85 are rejected.

Terminal Disclaimer

Applicants have filed a terminal disclaimer to obviate the double patenting rejection made over U.S. Patent No. 6,866,863. The terminal disclaimer was filed 04-06-2006 and was approved 04-16-2006. Thus the double patenting rejection has been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6, 7, 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hood, US 4001446.

Hood discloses a process in which a chromatic change agent added to meat and upon agitation and heating the color of the meat is changed (col. 5, lines 10-40). The reference teaches that the carbon monoxide is added to the meat source (such as dog food) and is agitated. The reference further teaches that subsequent treatment of the

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meat with heat will further change the color of the food product from bright red to brown (col. 5, lines 23). Further color change is induced through sterilization with nitrate treatment (col. 5, lines 36-40). Thus the reference clearly teaches adding an agent that induces color change when acted upon by both physical and chemical triggering mechanisms in sequential order.

Response to Arguments

Applicant's arguments filed 04-06-2006 have been fully considered but they are not persuasive. Applicants argue that Hood does not teach a chromic change agent that undergoes an intrinsic color change. The Examiner disagrees with Applicant assessment that the chromic change agent taught by Hood is the carbon monoxide. It is the Examiners position that the heme is the color change agent. Applicants argument that the binding of the carbon monoxide to the heme is the cause of the color change, and does not constitute an intrinsic change is not persuasive because although claims 1 excludes binding pair interactions, claim 2 defines the physical or chemical triggering mechanisms that cause the color change that are due to binding pair interactions for example, a change of pH, or another example a change in certain chemical constituents in an ingestible matrix. A change in pH is due to the association and disassociation of protons and hydroxide ions, these "binding interactions" cause the change in pH. In the case of the Hood reference, a "change in certain chemical constituents in an ingestible matrix" is taking place. The heme of the "ingestible matrix" (meat) is being changed due to the carbon monoxide interaction with the heme.

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Claims 1-3, 6, 7, 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Assal et al. US 4150106.

Assal discloses a color changing toothpaste that comprises chlorophenol red, and the color change triggering mechanism is due to a pH change induced by an acid/base buffer between citrate and citric acid (col. 1, lines 43-56) and interactions with the pH of the saliva. Thus the color change is intrinsic to chlorophenol red. The triggering mechanism is a change in pH. The ingestible is a toothpaste. Toothpaste is applied by brushing which is a rubbing or scratching mechanism that induced friction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 12, 15-25, 29-33, 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel US 4208186.

Teaches adding diacetylene compounds to perishable articles such as frozen foods (col. 8, lines 44-47). The reference teaches that other diacetylenic compounds are equivalent and would be obvious to use in the invention taught by the reference (col. 4, lines 50-52). The reference teaches that the active form of diacetylene undergoes color change upon thermal annealing (col. 2, lines 26-27). The invention can be used in a temperature range from -70 to 150 degrees Celsius (col. 6, lines 33-34). The reference teaches that the form of diacetylene incorporated in the perishable article is in the inactive form, and upon contacting the inactive form with an activating vapor, the diacetylene is activated and is then capable of changing color via thermal annealing (claim 1). The activating vapors are chemical compounds such as p-dioxane, dimethylformamide, pyridine, or mixtures (col. 5, lines 30-35). These compounds are a

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chemical trigger. The chemical trigger step is followed by a physical trigger, heat annealing. The two steps are sequential, and lead to at least one change in color.

The reference does not teach using polymer of the diacetylene monomers as the color change inducer.

It would have been obvious to one of ordinary skill in the art to use polydiacetylene because the reference teaches that other diacetylene compounds can be used, and polydiacetylenes are made from diacetylene monomers. One of ordinary skill in the art would have been motivated to use the polymeric diacetylene monomers because they would already be activated and would not require an additional activation step before a color change could be induced. One of ordinary skill in the art would be motivated to add color changing diacetylene monomers or polymers to any edible composition, both solid and liquid in order to change the color and make the solid or liquid food more pleasing to the eye.

Claim 85 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel US 4208186 in view of Rubner et al. US 4721769.

Teaches adding diacetylene compounds to perishable articles such as frozen foods (col. 8, lines 44-47). The reference teaches that other diacetylenic compounds are equivalent and would be obvious to use in the invention taught by the reference (col. 4, lines 50-52). The reference teaches that the active form of diacetylene undergoes color change upon thermal annealing (col. 2, lines 26-27). The invention can be used in a temperature range from -70 to 150 degrees Celsius (col. 6, lines 33-34). The reference teaches that the form of diacetylene incorporated in the perishable article is in the

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inactive form, and upon contacting the inactive form with an activating vapor, the diacetylene is activated and is then capable of changing color via thermal annealing (claim 1). The activating vapors are chemical compounds such as p-dioxane, dimethylformamide, pyridine, or mixtures (col. 5, lines 30-35). These compounds are a chemical trigger. The chemical trigger step is followed by a physical trigger, heat annealing. The two steps are sequential, and lead to at least one change in color.

The reference does not teach the color change induced by the diacetylene compounds to be reversible.

Rubner teaches that certain polydiacetylenes exhibit reversible color changes as the temperature is elevated and reduced (col. 7, lines 23-27).

It would have been obvious to one of ordinary skill in the art to use polydiacetylene to make an edible composition that exhibits reversible color change because the reference teaches that certain polydiacetylene compounds can exhibit such behavior. One of ordinary skill in the art would have been motivated to use the polymeric diacetylene monomers because they would already be activated and would not require an additional activation step before a color change could be induced. One of ordinary skill in the art would be motivated to add color changing diacetylene monomers or polymers to any edible composition, both solid and liquid in order to change the color and make the solid or liquid food more pleasing to the eye.

Claim 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel US 4208186 in view of Charych US 6468759.

Patel has been discussed above.

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Patel does not disclose the use of enzymes as a triggering mechanism for the color change of the diacetylene polymers.

Charych discloses that it is well known in the art to use diacetylene polymers and biopolymeric materials for detecting enzymatic reactions (col. 23, lines 17-23).

Thus it would be obvious to one of ordinary skill in the art to use enzymes as the triggering mechanism to induce color change of the diacetylene polymers because Charych discloses that it is well known in the art to do so. One of ordinary skill in the art would be motivated to use these diacetylene polymers in food products to detect spoilage because the degradation of food products carried out by microorganisms would cause enzymatic reactions. These enzymatic reactions would be detectable by the color changes of the diacetylene polymers, and thus would be effective in warning the consumer about the spoilage of the perishable food item.

Claim 9, 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel US 4208186 in view of Patel US 6472214.

Patel '186 has been discussed above.

Patel '186 does not disclose the use of enzymes as a triggering mechanism for the color change of the diacetylene polymers.

Patel '214 discloses that polymerized diacetylenes undergo reversible color change when contacted with an activator solvent such as acetone (col. 7, lines 39-46).

Thus it would be obvious to one of ordinary skill in the art to use solvents such as acetone in conjunction with diacetylene polymers because Patel teaches that to do so would induce a color change. One of ordinary skill in the art would be motivated to use

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this polymer to detect solvents such as acetone which may have inadvertently become in contact with food. A color change may indicate that the food had been contaminated with acetone and would effectively warn the manufacturer or the consumer due to the induced color change.

Claims 29-33, 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel US 4208186 in view of Patel US 5053339.

Teaches adding diacetylene compounds to perishable articles such as frozen foods (col. 8, lines 44-47). The reference teaches that other diacetylenic compounds are equivalent and would be obvious to use in the invention taught by the reference (col. 4, lines 50-52). The reference teaches that the active form of diacetylene undergoes color change upon thermal annealing (col. 2, lines 26-27). The invention can be used in a temperature range from -70 to 150 degrees Celsius (col. 6, lines 33-34). The reference teaches that the form of diacetylene incorporated in the perishable article is in the inactive form, and upon contacting the inactive form with an activating vapor, the diacetylene is activated and is then capable of changing color via thermal annealing (claim 1). The activating vapors are chemical compounds such as p-dioxane, dimethylformamide, pyridine, or mixtures (col. 5, lines 30-35). These compounds are a chemical trigger. The chemical trigger step is followed by a physical trigger, heat annealing. The two steps are sequential, and lead to at least one change in color.

Patel '186 does not teach the various kinds of foods and beverages in which a color change agent could be useful.

Patel '339 discloses examples of perishable food items in which a color change agent could be useful, such as fresh, refrigerated or frozen food, vegetable and fruits, juices, soft and alcoholic beverages, bakery products, etc. (col. 1, lines 23-30).

It would be obvious to one of ordinary skill in the art to use the diacetylene polymers in icings, beverages, solid foods and other various food products because Patel '339 teaches it would be useful to do so. One would be motivated to use the diacetylene polymers because they are sensitive to changes in temperature and would provide warning to possible spoilage of food prior to consumption.

Response to Arguments

Applicants argue that Patel does not teach an ingestible composition wherein the entire composition is ingestible. This argument is not persuasive because the claims are interpreted with the broadest reasonable interpretation. The adhesive composition comprising the chromic agent is applied to the ingestible composition. The claims merely require that the ingestible composition (in this case it would be the food disclosed by Patel) comprise a chromic change agent. Once the adhesive layer is applied to the food then the limitations of the claims are met, that being, an ingestible composition comprising a chromic change agent, the chromic change agent once applied to the food is then a part of the food. The claim does not require that the chromic change agent be ingested, it only requires that the ingestible composition (in this the food item) need be ingestible. Thus Applicant's arguments based on Patel are not persuasive. Applicants further arguments regarding the combination of references

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rely on Applicants assertion of the deficiency of Patel. As it has been discussed above, Patel satisfies the requirements of claim 1, and thus is not deficient. All rejections are therefore maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

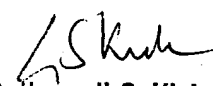
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pili A. Hawes whose telephone number is 571-272-8512. The examiner can normally be reached on 8-4:30 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 571-272-8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

P.A. Hawes
Examiner-1615


Gollamudi S. Kishore, Ph.D.
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